



Intel[®] Server Systems SR1530AH, SR1530AHLX and SR1530HAHLX

Technical Product Specification

Intel order number D77400-004

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Enterprise Platforms and Services Division - Marketing

Revision History

| Date | Revision Number | Modifications |
|---------------|-----------------|--|
| November 2006 | 1.0 | Initial release. |
| January 2007 | 1.1 | Added hot-swap version of the system. |
| October 2007 | 1.2 | Add "Environmental altitude operation specification" |
| April 2008 | 1.3 | Add Reference documents and correct error |

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1. Introduction

The Intel® Server Systems SR1530AH, SR1530AHLX, and SR1530HAHLX are 1U server systems. The key differences are outlined below:

- The Intel® Server Systems SR1530AH and SR1530AHLX support one or two fixed Serial ATA (SATA) hard disk drives. The Intel® Server System SR1530AH includes the Intel® Server Board S3000AH, and the Intel® Server System SR1530AHLX includes the Intel® Server Board S3000AHLX.
- The Intel® Server System SR1530HAHLX supports up to three hot- swap SATA disk drives and includes the Intel® Server Board S300AHLX.

The server boards and the server systems have features that are designed to support the high-density server market. This chapter provides a high-level overview of the system features. Greater detail for each major system component or feature is provided in the following chapters.

1.1 System Views



Figure 1. Intel® Server Systems SR1530AH / SR1530AHLX



Figure 2. Intel® Server System SR1530HAHLX

1.2 Chassis Dimensions

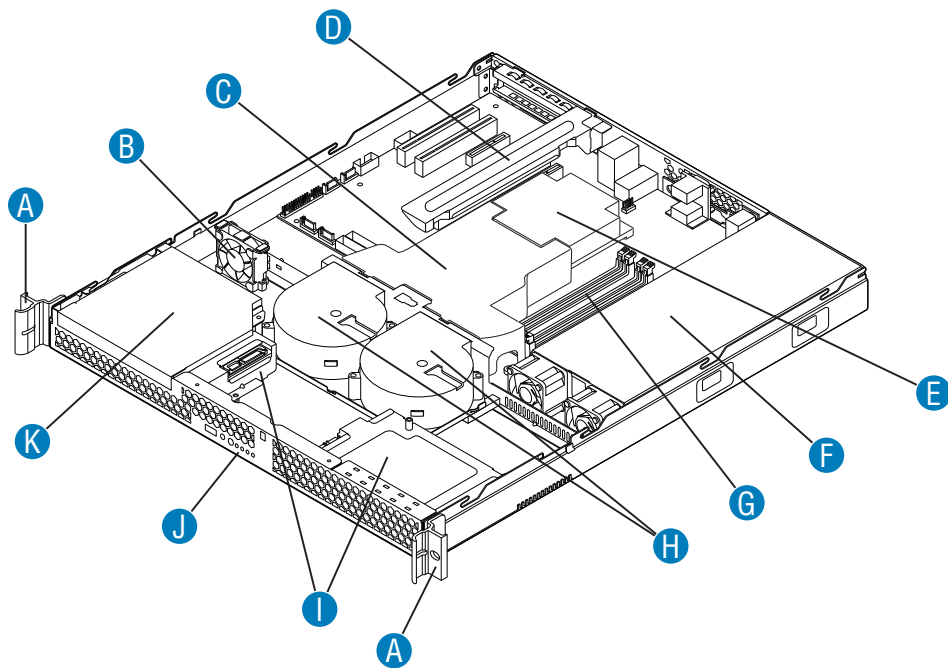
Table 1. Intel® Server Systems SR1530AH / SR1530AHLX Dimensions

| | | |
|---------------------|--------------|-----------|
| Height | 1.67 inches | 42.42 mm |
| Width without rails | 16.93 inches | 430.02 mm |
| Depth | 20 inches | 508.00 mm |
| Maximum weight | 33 lbs | 15 kg |

Table 2. Intel® Server System SR1530HAHLX Dimensions

| | | |
|---------------------|--|-----------|
| Height | 1.67 inches | 42.42 mm |
| Width without rails | 16.93 inches | 430.02 mm |
| Depth | 25.51 inches (excluding hard drive carriers, front control panel bezel, rack handles and front bezel) | 648 mm |
| Maximum weight | 33 lbs | 15 kg |

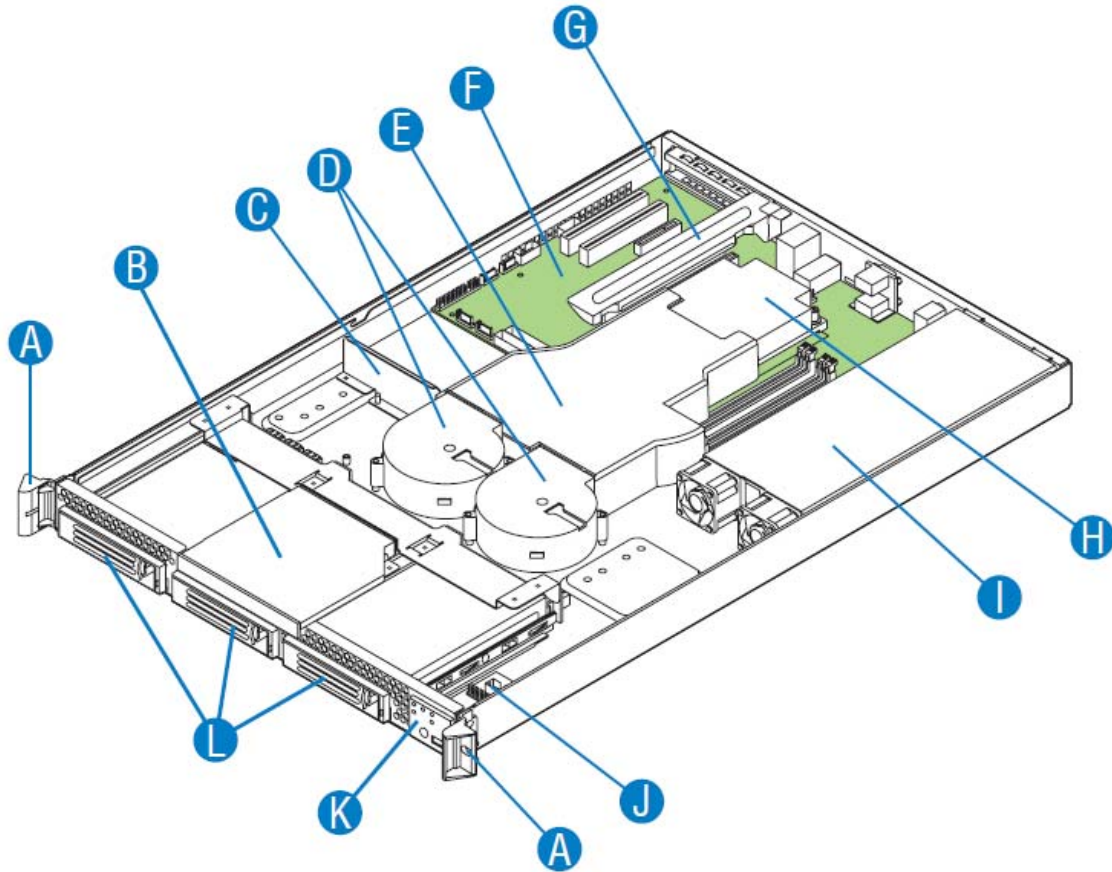
1.3 System Components



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| | | | |
|---|-------------------------|---|----------------------------|
| A | Rack handles (two) | G | System Memory DIMM Sockets |
| B | PCI cooling fan | H | System blower fans (two) |
| C | Processor air duct | I | Hard drives Brackets (two) |
| D | PCI add-in card bracket | J | Control panel |
| E | Processor and Heat Sink | K | Slimline optical drive |
| F | Power supply | | |

Figure 3. Intel® Server Systems SR1530AH / SR1530AHLX Major System Components

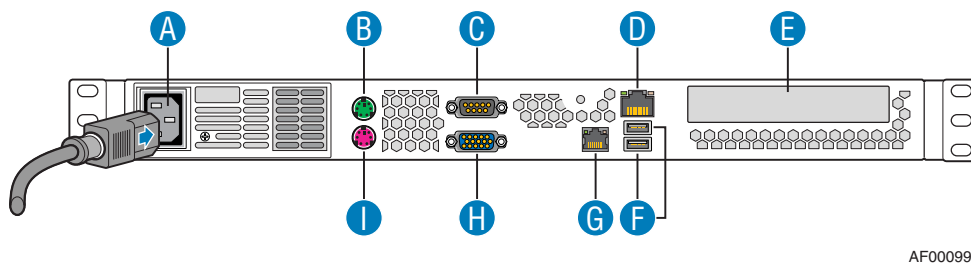


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| | | | |
|---|-------------------------------|---|-------------------------|
| A | Rack handles (2) | G | PCI Add-in Card Bracket |
| B | Slimline Optical Drive | H | Processor and Heat Sink |
| C | PCI Air Baffle | I | Power Supply |
| D | System Blower Fans (2) | J | Control Panel Board |
| E | Processor Air Duct | K | Control Panel |
| F | Intel® Server Board S3000AHLX | L | Hard Drive Bays (3) |

Figure 4. Intel® Server System SR1530HAHLX Major System Components

The I/O connector locations on the back of the system are pre-cut, so an I/O shield is not required. The EMI gasket is pre-installed to maintain electromagnetic interference (EMI) compliance levels. The layout arrangement is the same for both the fixed and hot-swap systems.



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| | | | |
|---|--|---|------------------------|
| A | AC Power Connector | F | USB Ports 0 - 1 |
| B | PS/2 Mouse Port | G | NIC 2 (10/100/1000 Mb) |
| C | Serial Port (DB-9) | H | Video Connector |
| D | NIC1 (10/100/1000 Mb) | I | PS/2 Keyboard Port |
| E | PCI-X* / PCI Express* Add-in Card Slot | | |

Figure 5. Back Panel Features

1.4 System Boards

The Intel® Server Systems SR1530AH, SR1530AHLX, and SR1530HAHLX include system boards that are used as internal interconnects and provide feature accessibility. The following section provides a brief description for each.

1.4.1 Intel® Server System SR1530AHLX

The Intel® Server System SR1530AHLX includes an Intel® Server Board S3000AHLX. This board supports two different riser card options:

- PCI-X*: Supports a single full height/half-length PCI-X* 66/100 MHz add-in card.
- PCI Express*: Supports a single full height/half-length x8 PCI Express* add-in card.

1.4.2 Intel® Server System SR1530AH

The Intel® Server System SR1530AH includes an Intel® Server Board S3000AH. This board supports a PCI Express* riser card which is capable of supporting a single full height/half-length x8 PCI Express* add-in card.

The Intel® Server Systems SR1530AH and SR1530AHLX include a front control panel. The front control panel is a printed circuit board routing the outputs of the system board SSI connector to provide a power on/off switch, a power on/off LED, a Hard Disk Drive activity LED, NIC 1 and NIC 2 activity LEDs, and USB port 2.

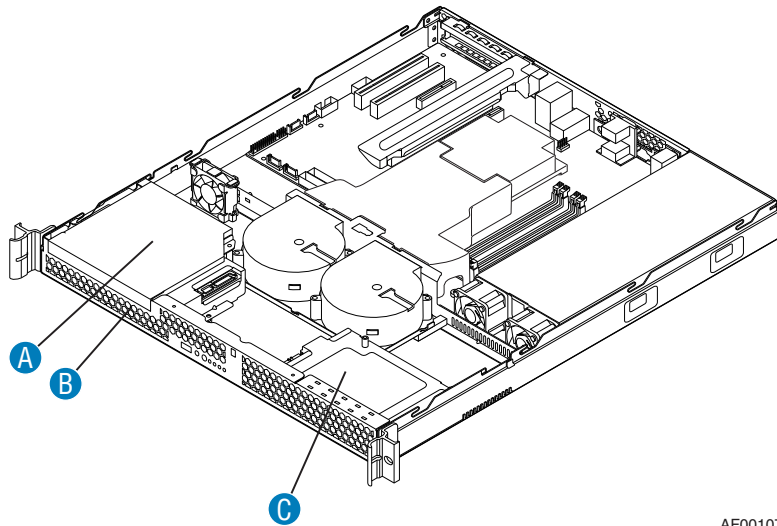
1.4.3 Intel® Server System SR1530HAHLX

The Intel® Server System SR1530HAHLX is only available with the Intel® Server Board S3000AHLX. This board supports two different riser card options:

- PCI-X*: Supports a single full height/full-length PCI-X* 66/100 MHz add-in card.
- PCI Express*: Supports a single full height/full-length x8 PCI Express* add-in card.

1.5 Hard Drive and Peripheral Bays

The Intel® Server Systems SR1530AH and SR1530AHLX are designed to support up to two fixed 3.5-inch SATA hard drives and one slimline optical device.

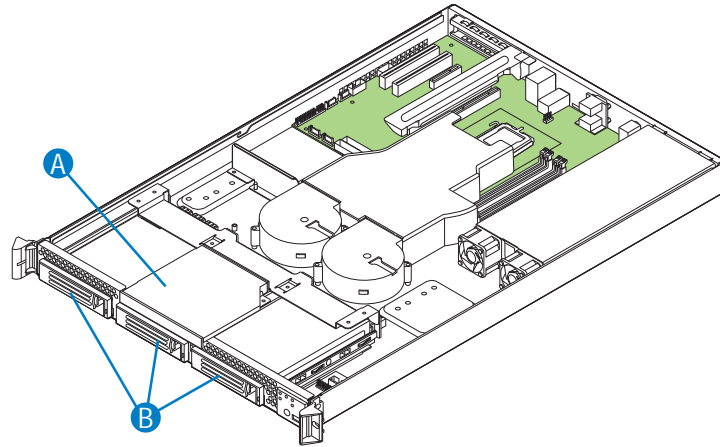


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| | |
|---|--|
| A | Slimline optical drive bay |
| B | Hard drive bay HDD0 (located under the slimline optical drive bay) |
| C | Hard drive bay HDD1 |

Figure 6. Intel® Server Systems SR1530AH / SR1530AHLX Drive Bays

The Intel® Server System SR1530HAHLX is designed to support up to three hot-swap SATA hard drives and one slimline optical device.



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| | |
|---|----------------------------|
| A | Slimline Optical Drive Bay |
| B | Hot-Swap Drive Bays |

Figure 7. Intel® Server System SR1530HAHLX Drive Bays

1.6 System Cooling

The Intel® Server Systems SR1530AH and SR1530AHLX provide two non-redundant blower fans and one PCI cooling fan. The Intel® Server System SR1530HAHLX provides two non-redundant blower fans. When external ambient temperatures remain within specified limits, the cooling system provides sufficient air flow for all drive configurations, processors, supported memory, and add-in cards.

1.7 Rack and Cabinet Mounting Options

The server systems support 19-inch wide by up to 30-inch deep server cabinets. The server systems supports three rack mount options:

- A basic slide rail kit (Product order code – AXXBASICRAIL): Designed to mount the chassis into a standard (19-inch by up to 30-inch deep) EIA-310D compatible server cabinet. This kit is included with the server system.
- A fixed mount relay rack / cabinet mount kit (Product order code - AXXBRACKETS): Can be configured to mount the system into either a 2-post or 4-post rack cabinet.
- A tool-less full extracting slide rail kit (Product order code – AXXHERAIL): Designed to support an optional cable management arm (Product order code – AXXRACKCARM).

2. Power Sub-System

The power sub-system of the server systems consist of a single non-redundant 350 W power supply with 5 outputs; 3.3V, 5V, 12V, and 5VSB. The form factor fits into a 1U system and provides a wire harness output to the system. An IEC connector is provided on the external face for AC input to the power supply. The power supply provides two non-redundant 40mm fans for self cooling. The power supply fans also provide additional airflow.

The power supply operates within the following voltage ranges and ratings:

| Parameter | Minimum | Rated | Maximum | Start up VAC | Power Off VAC |
|---------------|----------|--------------|----------|---------------|---------------|
| Voltage (110) | 90 Vrms | 100-127 Vrms | 140 Vrms | 85Vac +/-4Vac | 75Vac +/-5Vac |
| Voltage (220) | 180 Vrms | 200-240 Vrms | 264 Vrms | | |
| Frequency | 47 Hz | | 63 Hz | | |

The power supply must operate within all specified limits over the following input voltage range, shown in the table. Harmonic distortion of up to 10% THD will not cause the power supply to go out of specified limits. The power supply will power off if the AC input is less than 75VAC +/- 5VAC range. The power supply will start up if the AC input is greater than 85VAC +/-4VAC. Application of an input voltage below 85VAC will damage the power supply, including a fuse blow.

2.1 Mechanical Specifications

The 1U 350 W power supply is designed specifically for use in the Intel® Server Systems SR1530AH, SR1530AHLX, and SR1530HAHLX. The physical size of the power supply enclosure accommodates power ranges from 350 W. The power supply size is 40mm x 106mm x 300mm and has a wire harness for the DC outputs. The AC input plugs directly into the external face of the power supply. Refer to the following figure for more information.

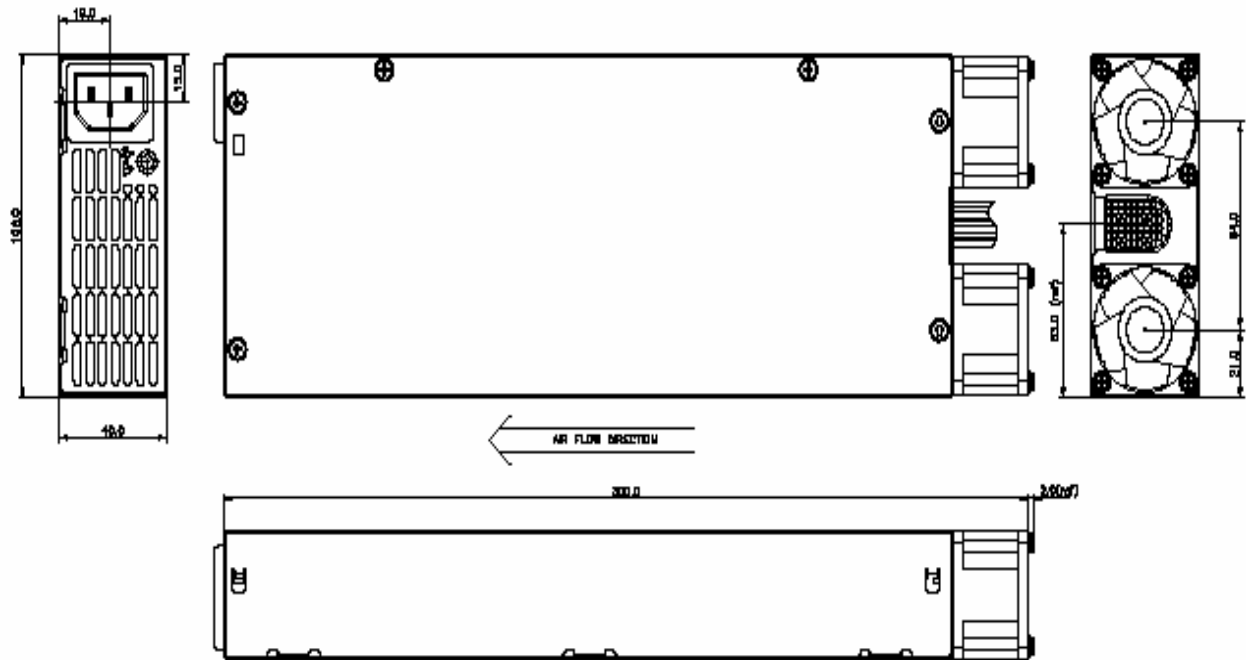


Figure 8. Power Supply Enclosure Drawing

Note: All dimensions are in mm. The tolerance of the 40mm height dimension (marked with letter C) pertains to the metal case only.

2.2 Output Connectors

Listed or recognized component appliance wiring material (AVLV2), CN, rated min 80°C, 300VDC must be used for all output wiring.

Table 3. Intel® Server Systems SR1530AH / SR1530AHLX Cable Lengths

| From | Length (mm) | To connector # | Description |
|------------------------------|-------------|----------------|---------------------------|
| Power Supply cover exit hole | 380 | P1 | Baseboard Power Connector |
| Power Supply cover exit hole | 390 | P2 | Processor Power Connector |
| Power Supply cover exit hole | 495 | P3 | HD Power Connector |
| Power Supply cover exit hole | 605 | P4 | HD Power Connector |
| Power Supply cover exit hole | 860 | P5 | Slimline Power Connector |

Table 4. Intel® Server System SR1530HAHLX Cable Lengths

| From | Length (mm) | To connector # | Description |
|------------------------------|-------------|----------------|----------------------------|
| Power Supply cover exit hole | 400 | P1 | Baseboard Power Connector |
| Power Supply cover exit hole | 380 | P2 | Processor Power Connector |
| Power Supply cover exit hole | 220 | P7 | 2 x 4 HSBP power connector |
| P7 | 100 | P4 | SATA Drive Power Connector |
| P4 | 145 | P5 | SATA Drive Power Connector |
| P5 | 170 | P6 | CD-ROM Power Connector |

2.2.1 Baseboard power connector (P1)

Connector housing: 20-Pin Molex* Mini-Fit Jr. 39-01-2200 or equivalent.

Contact: Molex Mini-Fit, HCS, female, crimp 44476 or Molex 5556 as the alternative, or equivalent approved by Intel.

Table 5. P1 Main Power Connector

| Pin | Signal | 18 AWG Color | Pin | Signal | 18 AWG Color |
|-----|---------|----------------------|-----|----------|-------------------|
| 1* | +3.3VDC | Orange | 11 | +3.3VDC | Orange |
| | 3.3V RS | Orange/White (24AWG) | 12 | -12VDC | Blue |
| 2 | +3.3VDC | Orange | 13 | COM | Black |
| 3 | COM | Black | 14 | PSON# | Green (24AWG) |
| 4 | +5VDC | Red | 15* | COM | Black |
| 5 | COM | Black | | COMRS | Black (24AWG) |
| 6 | +5VDC | Red | 16 | COM | Black |
| 7 | COM | Black | 17 | COM | Black |
| 8 | PWR OK | Gray (24AWG) | 18 | Reserved | N.C. |
| 9 | 5 VSB | Purple | 19 | +5VDC | Red |
| 10* | +12V | Yellow | 20* | +5VDC | Red |
| | 12VRS | Yellow/White (24AWG) | | 5VRS | Red/White (24AWG) |

Notes: The Remote Sense wire is double crimped.
The P1 add cable bend requirement is at P1.

2.2.2 Processor Power Connector (P2)

Connector housing: 8-Pin Molex 39-01-2085 or equivalent.

Contact: 44476-1111 or Molex 5556 as the alternative, or equivalent.

Table 6. P2 Processor Power Connector

| Pin | Signal | 18 AWG color | Pin | Signal | 18 AWG Color |
|-----|--------|--------------|-----|--------|--------------|
| 1 | COM | Black | 5 | +12V | Yellow |
| 2 | COM | Black | 6 | +12V | Yellow |
| 3 | N.C. | | 7 | N.C. | |
| 4 | N.C. | | 8 | N.C. | |

2.2.3 SATA Hard Drive Power Connectors (P4, P5)

Connector housing: JWT A3811H00-5P (94V2) or equivalent.

Contact: JWT A3811TOP-0D or equivalent.

Table 7. HD Power Connector

| Pin | Signal | 18 AWG Color |
|-----|--------|--------------|
| 1 | +3.3V | Orange |
| 2 | COM | Black |
| 3 | +5VDC | Red |
| 4 | COM | Black |
| 5 | +12V | Yellow |

2.2.4 CDROM Power Connector (P6)

Connector housing: Molex* 51065-0400 (94V2) or equivalent.

Contact: Molex* 50212-8000 contact or equivalent.

Table 8. CD-ROM Power Connector

| PIN | SIGNAL | 22 AWG COLOR | PIN | SIGNAL | 22 AWG COLOR |
|-----|--------|--------------|-----|--------|--------------|
| 1 | +5VDC | Red | 3 | COM | Black |
| 2 | COM | Black | 4 | +12V | Yellow |

2.2.5 Intel® Server System SR1530HAHLX P7 Hot-swap Backplane Power Connector

Connector housing: 8-pin Molex* 39-01-2085 2 x 4 or equivalent.

Contact: Molex* 2x4 mini fit Jr, HCS, 44476-3111 or equivalent.

Table 9. P7 HSBP Power Connector

| PIN | SIGNAL | 18 AWG COLOR | PIN | SIGNAL | 18 AWG COLOR |
|-----|--------|--------------|-----|--------|-------------------|
| 1 | COM | Black | 5 | 12V4 | Blue/White Stripe |
| 2 | COM | Black | 6 | NC | |
| 3 | +5V | Red | 7 | NC | |
| 4 | NC | | 8 | 3.3V | Orange |

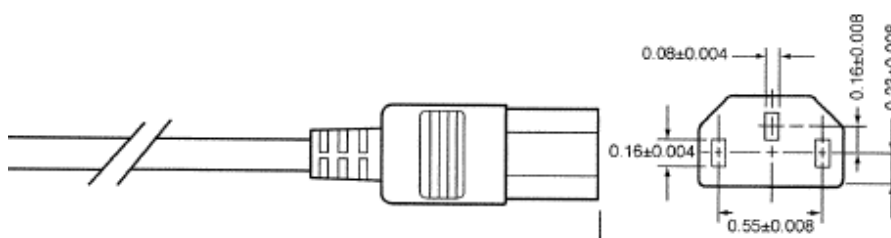
2.3 AC Inlet Connector

The AC input connector must be an *IEC 320 C-14* power inlet. This inlet is rated for 10A / 250VAC.

2.3.1 AC Power Cord Specification Requirements

The AC power cord must meet the following specification requirements:

| Cable Type | SJT |
|--------------------|--------|
| Wire Size | 16 AWG |
| Temperature Rating | 105° C |
| Amperage Rating | 13A |
| Voltage Rating | 125V |



2.4 Marking and Identification

The power supply module marking supports the following requirements: safety agency requirements, government requirements (if required, e.g. point of manufacturing), power supply vendor requirements, and Intel manufacturing and field support requirements.

2.5 AC Input Voltage

The power supply must operate within all specified limits over the following input voltage range, shown in the table below. Harmonic distortion of up to 10% of the **rated line voltage** will cause the power supply to go out of specified limits. The power supply will power off if the AC input is less than 75VAC +/-5VAC range. The power supply will start up if the AC input is greater than 85VAC +/-4VAC. Application of an input voltage below 85VAC will not cause damage to the power supply, including a fuse blow.

Table 10. AC Input Rating

| PARAMETER | MIN | RATED | V _{MAX} | I _{MAX} | Start up VAC | Power Off VAC |
|---------------|----------------------|--------------------------|----------------------|--------------------|---------------|---------------|
| Voltage (110) | 90 V _{rms} | 100-127 V _{rms} | 140 V _{rms} | 6 A ^{1,3} | 85VAC +/-4VAC | 75VAC +/-5VAC |
| Voltage (220) | 180 V _{rms} | 200-240 V _{rms} | 264 V _{rms} | 3 A ^{2,3} | | |
| Frequency | 47 Hz | 50/60 | 63 Hz | | | |

Notes:

¹ Maximum input current at low input voltage range will be measured at 90VAC, at max load.

² Maximum input current at high input voltage range will be measured at 180VAC, at max load.

³ This requirement is not to be used for determining agency input current markings.

2.6 Output Power / Currents

The following tables define two power and current ratings for the 350 W power supply. The combined output power of all outputs should not exceed the rated output power. The power supply must meet both static and dynamic voltage regulation requirements for the minimum loading conditions.

Table 11. Load Ratings

| Voltage | Minimum Continuous Load | Maximum Continuous Load ^{1,3} | Peak Load ^{2,3} |
|--------------------|-------------------------|--|--------------------------|
| +3.3V ⁴ | 1.5 A | 14 A | |
| +5V ⁴ | 1.0 A | 18 A | |
| +12V | 1.5 A | 24 A | 28 A |
| -12V | 0 A | 0.3 A | |
| +5VSB | 0.1 A | 2.0 A | 2.5 A |

Notes:

¹ Maximum continuous total DC output power should not exceed 350 W.

² Peak total DC output power should not exceed 400 W.

³ Peak power and peak current loading will be supported for a minimum of 12 seconds.

⁴ Combined 3.3V/5V power must not exceed 100 W.

2.7 Protection Circuits

Protection circuits inside the power supply will cause only the power supply's main outputs to shutdown. If the power supply latches off due to a protection circuit tripping, an AC cycle OFF for 15 sec and a PSON[#] cycle HIGH for 1 sec will reset the power supply.

2.8 Over Current Protection (OCP)

The power supply has current limits to prevent the +3.3V, +5V, and +12V outputs from exceeding the values shown in the table below. If the current limits are exceeded, the power supply will shutdown and latch off. The latch is cleared by toggling the PSON[#] signal or by an AC power interruption. The power supply will not be damaged from repeated power cycling in this condition. -12V and 5VSB is protected under over-current or shorted conditions so the power supply cannot be damaged. 5Vsb will be auto-recovered after removing the OCP limit.

Table 12. Over Current Protection (OCP)

| VOLTAGE | OVER CURRENT LIMIT | |
|---------|--------------------|-----|
| | MIN | MAX |
| +3.3V | 15A | 21A |
| +5V | 20A | 27A |
| +12V | 30A | 40A |
| -12V | 0.625A | 2A |
| 5VSB | N/A | 4A |

2.9 Over-Voltage Protection (OVP)

The power supply over-voltage protection is locally sensed. The power supply will shutdown and latch off after an over-voltage condition occurs. This latch is cleared by toggling the PSON[#] signal or by an AC power interruption. The table below contains the over-voltage limits. The values are measured at the output of the power supply's pins. The voltage should never exceed the maximum levels when measured at the power pins of the power supply connector during any single point of fail. The voltage should never trip any lower than the minimum levels when measured at the power pins of the power supply connector. 5Vsb will be auto-recovered after removing the OVP limit. The exception to this is a +5VSB rail, which should be able recover after an over-voltage condition occurs.

Table 13. Over-Voltage Protection (OVP) Limits

| Output Voltage | MIN (V) | MAX (V) |
|----------------|---------|---------|
| +3.3V | 3.9 | 4.5 |
| +5V | 5.7 | 6.5 |
| +12V | 13.3 | 14.5 |
| -12V | -13.3 | -16 |
| +5VSB | 5.7 | 6.5 |

2.10 Over-Temperature Protection (OTP)

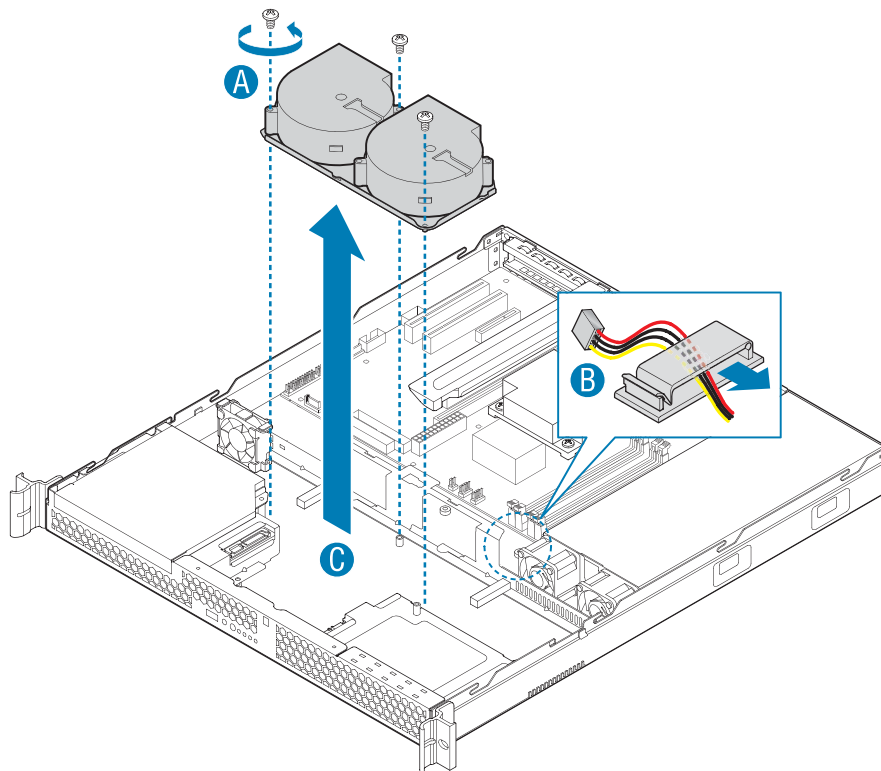
The power supply is protected against over-temperature conditions caused by loss of fan cooling or excessive ambient temperature. In an OTP condition the power supply will shutdown. When the power supply temperature drops to within specified limits, the power supply will restore power automatically, while the 5VSB remains always on. The OTP circuit must have built in hysteresis so the power supply will not oscillate on and off due to temperature recovering condition. The OTP trip level has a minimum of 4°C of ambient temperature hysteresis.

3. Cooling Sub-System

The Intel® Server System SR1530HAHLX cooling sub-system consists of two 97 x 94 x 33mm blower fans, a CPU air duct, and a PS / electronics bay isolation air baffle. The Intel® Server Systems SR1530AH and SR1530AHLX also include one additional 40 x 40 x 15mm PCI cooling fan. These components are used to provide the necessary cooling and airflow to the system. A fan on the processor heat sink is not required.

To maintain the necessary airflow within the system, the air duct and the top cover must be properly installed.

Note: The Intel® Server Systems SR1530AH, SR1530AHLX, and SR1530HAHLX do not support redundant cooling. If a fan blower fails, the system should be powered down as soon as possible so the failed fan blower can be replaced. The system fans cannot be hot swapped.

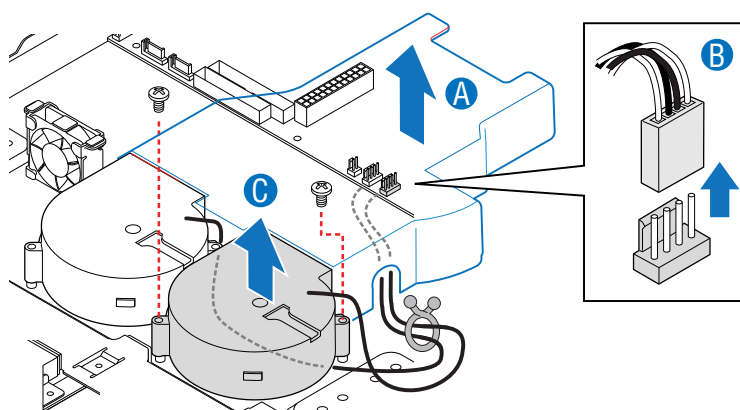


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Figure 9. Intel® Server Systems SR1530AH / SR1530AHLX Fan Module Assembly

Table 14. Intel® Server Systems SR1530AH / SR1530AHLX Cooling Zones

| Fan | Cooling Zone | Greatest Cooling Influence |
|-----------------------------|--------------|--|
| System Fan Blower #1 and #2 | CPU/MCH | Primary cooling for the CPU and the system memory |
| PCI Cooling Fan | PCI | Primary cooling for HDD0, full-height PCI cards, PXH |
| Power Supply Fans | PS | Primary cooling for HDD1 and the 350W power supply |



AF001633

Table 15. Intel® Server System SR1530HAHLX Cooling Zones

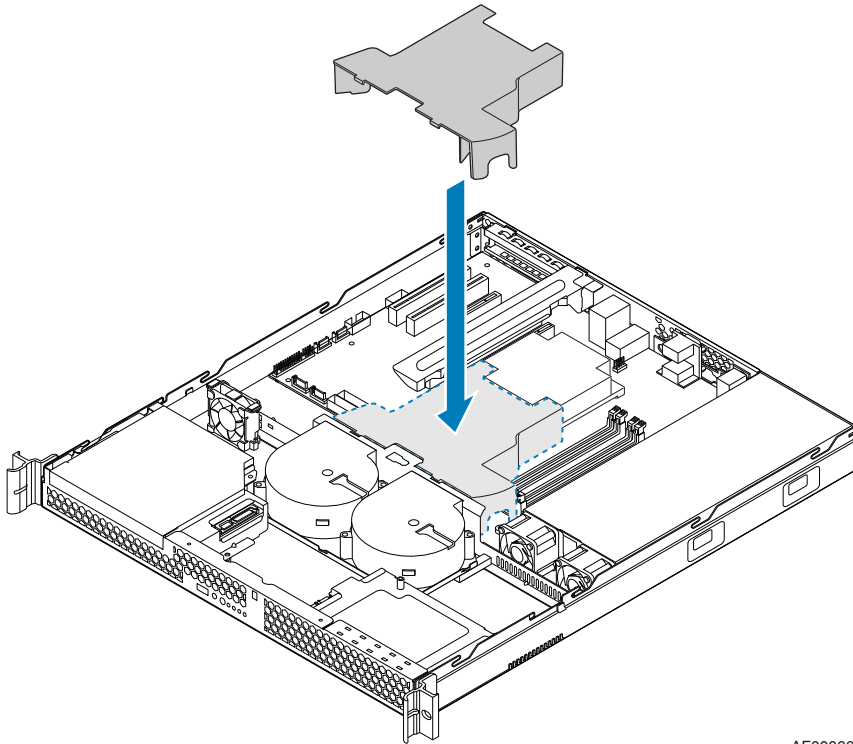
| Fan | Cooling Zone | Greatest Cooling Influence |
|-----------------------------|--------------|--|
| System Fan Blower #1 and #2 | CPU/MCH/PCI | The two system blowers provide cooling for the CPU, Memory, MCH, PCI slot and Hard Disk Drives |
| Power Supply Fans | PS | 350W power supply |

3.1 Power Supply Fans

The power supply supports two non-redundant 40 mm fans. They are responsible for the cooling of the power supply and the second hard drive bay.

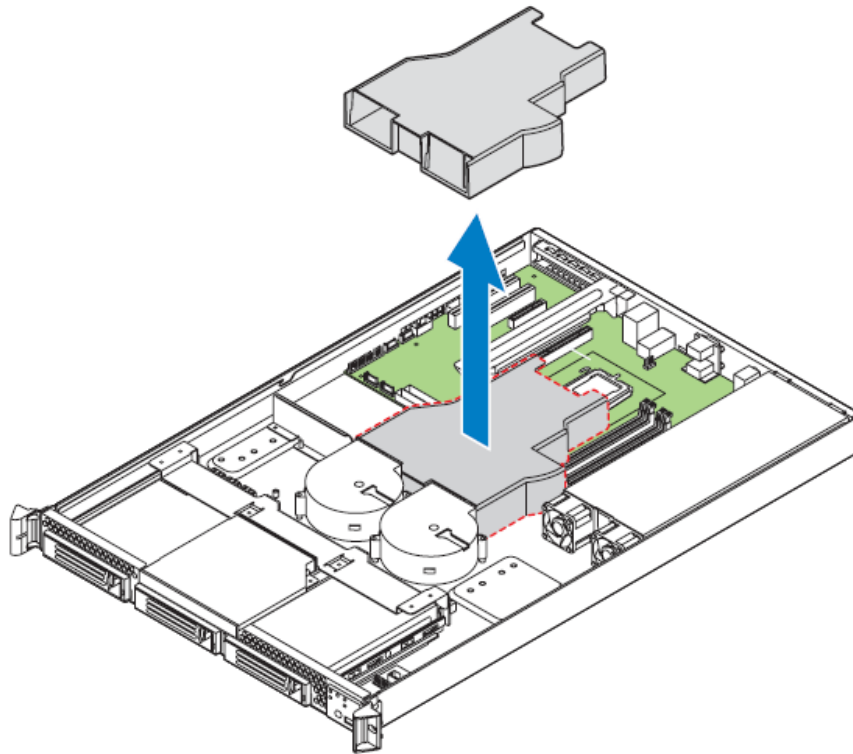
3.2 CPU Air Duct

The chassis requires the use of a CPU air duct to direct airflow through the MCH, processor heat sink and the memory areas.



AF000665

Figure 10. Intel® Server Systems SR1530AH / SR1530AHLX Air Duct

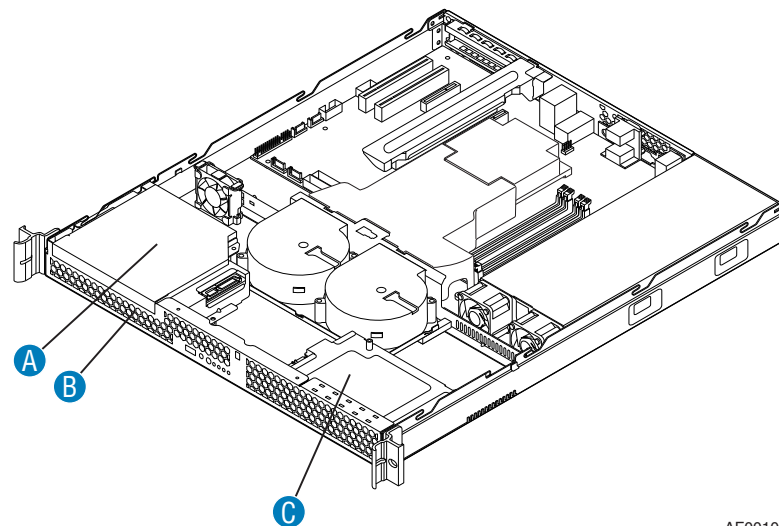


AF001580

Figure 11. Intel® Server System SR1530HAHLX Air Duct

4. Drive Support

The Intel® Server Systems SR1530AH and SR1530AHLX supports two fixed hard drive bays and one slimline peripheral drive bay at the front of the chassis. The fixed hard drive bays are designed to support SATA drives only.



| | |
|---|--|
| A | Slimline optical drive bay |
| B | Hard drive bay HDD0 (located under the slimline optical drive bay) |
| C | Hard drive bay HDD1 |

AF001074

Figure 12. Drive Bays

The Intel® Server System SR1530HAHLX supports three hot-swap hard drive bays and one slimline peripheral drive bay at the front of the system. The hot-swap drive bays are designed to support SATA drives only.

4.1 Optical Drive Support

Both the fixed and hot-swap systems provide a slimline drive bay that can be configured for an IDE optical CD-ROM, or DVD/CD-ROM drive. SATA optical drives are not currently supported when the on-board SATA controller is configured for RAID MODE. The slimline devices are not hot-swappable.

4.1.1 Optical Drive Support

The server systems support a slimline IDE optical drive. The drive is mounted with two side mount rail accessories and is connected to an interposer card attached to the drive. The drive assembly is then installed in to the slimline drive bay. A 40-pin ribbon cable is used to connect the drive assembly to a matching IDE connector on the server board.

Table 16. 40-pin Internal IDE Connector Pin-out (J3J2)

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1 | RESET# | 2 | GND |
| 3 | IDE_DD7 | 4 | IDE_DD8 |
| 5 | IDE_DD6 | 6 | IDE_DD9 |
| 7 | IDE_DD5 | 8 | IDE_DD10 |
| 9 | IDE_DD4 | 10 | IDE_DD11 |
| 11 | IDE_DD3 | 12 | IDE_DD12 |
| 13 | IDE_DD2 | 14 | IDE_DD13 |
| 15 | IDE_DD1 | 16 | IDE_DD14 |
| 17 | IDE_DD0 | 18 | IDE_DD15 |
| 19 | GND | 20 | KEY |
| 21 | IDE_DMAREQ | 22 | GND |
| 23 | IDE_IOW# | 24 | GND |
| 25 | IDE_IOR# | 26 | GND |
| 27 | IDE_IORDY | 28 | GND |
| 29 | IDE_DMAACK# | 30 | GND |
| 31 | IRQ_IDE | 32 | Test Point |
| 33 | IDE_A1 | 34 | DIAG |
| 35 | IDE_A0 | 36 | IDE_A2 |
| 37 | IDE_DCS0# | 38 | IDE_DCS1# |
| 39 | IDE_HD_ACT# | 40 | GND |

4.2 Hard Disk Drive Support

The Intel® Server Systems SR1530AH and SR1530AHLX support up to two 3.5-inch by 1-inch fixed SATA hard disk drives. The drives are mounted inside the chassis and are not hot-swappable. The Intel® Server System SR1530HAHLX supports up to three SATA hard disk drives mounted in hot-swappable drive carriers.

4.2.1 System Fan Connectors

The Intel® Server Systems SR1530AH and SR1530AHLX support two system fan blowers and one PCI cooling fan. The Intel® Server System SR1530HAHLX supports two system blower fans. The pin-out for each connector is provided in the following table.

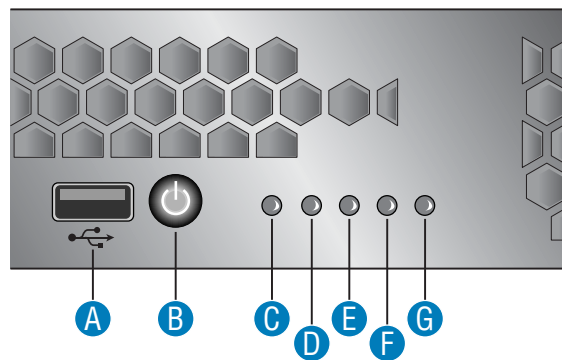
Table 17. System Four-pin Fan Headers Pin-outs (J7J1, J8D1, J4J1, and J6B1, J6J1)

| Pin | Signal Name | Type | Description |
|-----|-------------|---------|--|
| 1 | Ground | Power | GROUND is the power supply ground. |
| 2 | Fan Power | Power | Fan Power anode |
| 3 | Fan Tach | Out | FAN_TACH signal is connected to the Heceta to monitor the FAN speed. |
| 4 | PWM | Control | Pulse Width Modulation – Fan Speed Control signal |

5. Front Control Panel

The standard control panel supports a power button, status LED, hard drive activity LED, and NIC 1 and NIC 2 activity LEDs. The control panel assembly comes pre-assembled into the chassis. The control panel assembly module slides into a predefined slot on the front of the chassis. Once installed, communication to the server board is completed through a standard 24-pin cable connected directly to the server board.

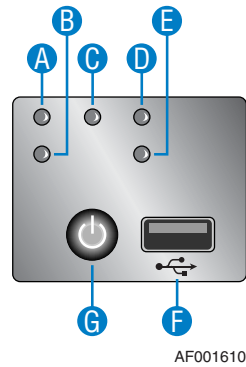
Note: The status LED is not used on the Intel® Server Systems SR1530AH, SR1530AHLX or SR1530HAHLX.



AF001000

| Item | Feature |
|------|--|
| A | USB port |
| B | Power button (also functions as a sleep button if enabled by an ACPI-compliant operating system) |
| C | Not Used |
| D | System power LED |
| E | Hard drive activity LED |
| F | NIC 1 LED |
| G | NIC 2 LED |

Figure 13. Intel® Server Systems SR1530AH / SR1530AHLX Front Control Panel



| Item | Feature |
|------|--|
| A | NIC 1 LED |
| B | NIC 2 LED |
| C | System power LED |
| D | Not Used |
| E | Hard drive activity LED |
| F | USB port |
| G | Power button (also functions as a sleep button if enabled by an ACPI-compliant operating system) |

Figure 14. Intel® Server System SR1530HAHLX Front Control Panel

Table 18. Control Panel LED Functions

| LED | Color | State | Description |
|----------------------------------|--|--------------|---------------------------|
| NIC1 / NIC2 Activity | Green | On | NIC Link/no access |
| | Green | Blink | LAN access |
| Power / Sleep (on standby power) | Green | On | Power on |
| | | Blink | Sleep / ACPI S1 state |
| | Off | Off | Power Off / ACPI S4 state |
| System Status (on standby power) | The status LED is not used on the Intel® Server Systems SR1530AH, SR1530AHLX or SR1530HAHLX. | | |
| Disk Activity | Green | Random blink | HDD access |
| | Off | Off | No hard disk activity |

The current limiting resistors for the power LED, the system fault LED, and the NIC LEDs are located on the Intel® Server Boards S3000AH and S3000AHLX.

5.1.1 Power / Sleep LED

Table 19. SSI Power LED Operation

| State | Power Mode | LED | Description |
|-----------|------------|-------------------------|--|
| Power Off | Non-ACPI | Off | System power is off, and the BIOS has not initialized the chipset. |
| Power On | Non-ACPI | On | System power is on, but the BIOS has not yet initialized the chipset. |
| S5 | ACPI | Off | Mechanical is off, and the operating system has not saved any context to the hard disk. |
| S4 | ACPI | Off | Mechanical is off, and the operating system has saved context to the hard disk. |
| S3-S1 | ACPI | Slow blink ¹ | DC power is still on. The operating system has saved context and gone into a level of low-power state. |
| S0 | ACPI | Steady on | System and the operating system are up and running. |

Note: ¹The blink rate is ~ 1Hz with at 50% duty cycle.

5.1.2 System Status LED

The system status LED is not available on the Intel® Server Boards S3000AH and S3000AHLX, or the Intel® Server Systems SR1530AH, SR1530AHLX and SR1530HAHLX.

5.1.3 Drive Activity LED

The drive activity LED on the front panel indicates drive activity from the onboard hard disk controllers. The Intel® Server Boards S3000AH and S3000AHLX also provide a header with access to this LED for add-in controllers.

6. PCI Riser Cards

The Intel® Server Board S3000AH supports one PCI Express* riser slot which accepts a single PCI Express* x8 full-height adapter card. The Intel® Server Board S3000AHLX supports either a PCI Express* x8, or a PCI-X* riser card inserted into the Intel® Adaptive Slot.

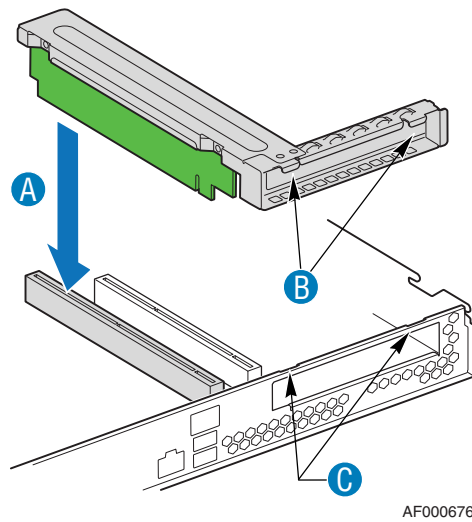


Figure 15. PCI Riser Card Assembly

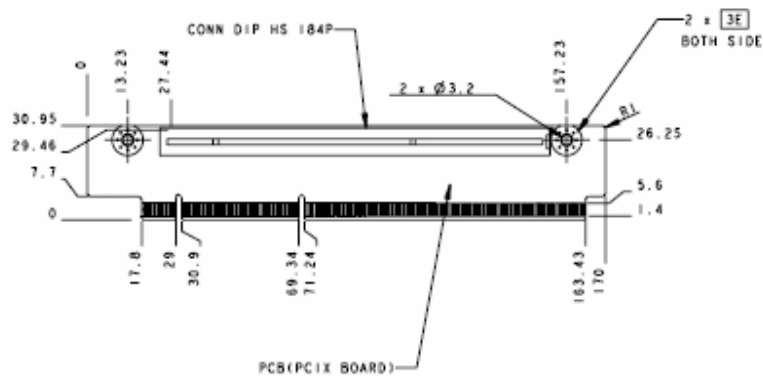


Figure 16. 1U PCI-X* Riser Card Mechanical Drawing

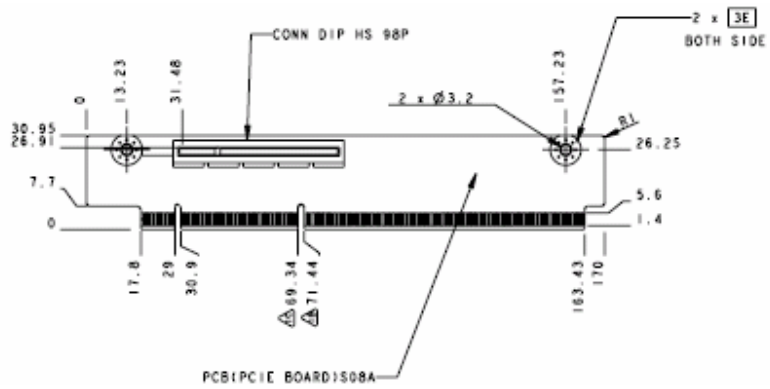


Figure 17. 1U PCI Express* Riser Card Mechanical Drawing

7. Hot-swap Backplane

The Intel® Server System SR1530HAHLX supports a passive backplane designed to be compatible with the Intel® Server Board S3000AHLX. The Intel® Server Board S3000AHLX is connected directly to the SATA backplane (default) or the backplane may be connected to an add-in SAS or SATA adapter.

The system supports a multifunctional SATA/SAS backplane with the following features:

- Three SATA/SAS compatible hot-swap hard drive connectors
- Three SATA/SAS connectors to the baseboard
- Hard Drive Activity LED for each hard drive connector
- One 2x4-pin power connector

The Intel® Server Board S3000AHLX on-board SATA controller supports the following RAID Arrays:

- Intel® Embedded Server RAID Technology - RAID 0 or RAID 1
- Intel® Matrix Storage Manager - RAID 0, 1 or 5 (Microsoft Windows* only)

The drive status LEDs are not supported on this system. A drive failure must be determined with third party management software. The drive activity LED will change to indicate a failed drive or drive rebuild activity.

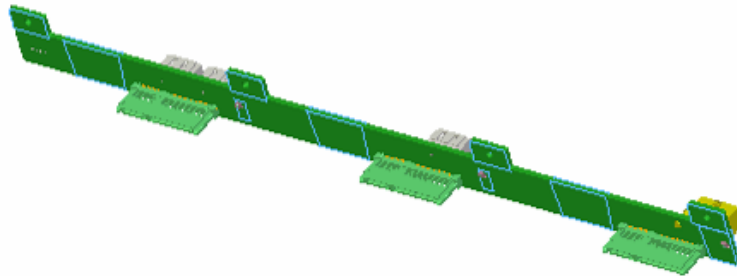


Figure 18. Intel® Server System SR1530HAHLX Hot-swap Backplane

Table 20. Passive SATA/SAS Backplane Power Connector Pin-out (J7)

| Pin # | Signal Name |
|-------|---------------|
| 1 | Ground |
| 2 | Ground |
| 3 | P5V |
| 4 | P5V |
| 5 | P12V |
| 6 | P12V |
| 7 | No Connection |
| 8 | P3V3 |

Table 21. Passive SATA/SAS Backplane Connector to Hard Drive Pin-out (J1, J2, J3)

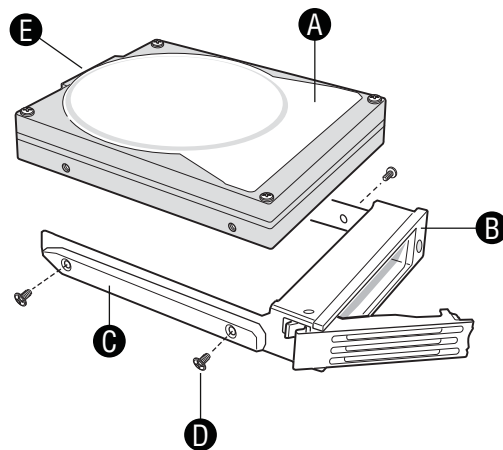
| Pin # | Signal Name |
|-------|------------------|
| S1 | Ground |
| S2 | SAS_DRVxA_RX_P |
| S3 | SAS_DRVxA_RX_N |
| S4 | Ground |
| S5 | SAS_DRVxA_TX_N |
| S6 | SAS_DRVxA_TX_P |
| S7 | Ground |
| P1 | TP |
| P2 | TP |
| P3 | TP |
| P4 | Ground |
| P5 | Ground |
| P6 | Ground |
| P7 | P5V_DRVx_PRECHG |
| P8 | P5V |
| P9 | P5V |
| P10 | Ground |
| P11 | LED_DRVx_READY_N |
| P12 | Ground |
| P13 | P12V_DRVx_PRECHG |
| P14 | P12V |
| P15 | P12V |

Table 22. Passive SATA/SAS Backplane I/O Connector to Baseboard Pin-out (J4, J5, J6)

| Pin # | Signal Name |
|-------|--------------|
| 1 | Ground |
| 2 | SASx_EP_RX_P |
| 3 | SASX_EP_RX_N |
| 4 | Ground |
| 5 | SASx_EP_TX_N |
| 6 | SASx_EP_TX_P |
| 7 | Ground |

7.1.1 Hot-swap Drive Trays

Each hard drive must be mounted into a hot-swap drive tray, making insertion and extraction of the drive from the system very simple. Each drive tray has a dual purpose latching mechanism which is used to insert and extract drives from the system and lock the tray in place. Each drive tray supports a light pipe providing a drive activity indicator, located on the backplane, to be viewable from the front of the system.



TP02106

Figure 19. Hard Drive Tray Assembly

| Item | Description |
|------|----------------------|
| A | Hard Drive |
| B | Drive Carrier |
| C | Slide Rail |
| D | Mounting Screw |
| E | Hard Drive Connector |

8. Supported Server Boards

The Intel® Server Systems SR1530AH, SR1530AHLX, and SR1530HAHLX are mechanically and functionally designed to support the Intel® Server Boards S3000AH and S3000AHLX. See the Intel® Server Board S3000AH Technical Product Specification for detailed server board information.

9. Specifications

9.1 System Level Environmental Limits

The table below defines the system level operating and non-operating environmental limits.

Table 23. System Environmental Limits Summary

| Parameter | Limits |
|--------------------------------------|--|
| Operating Temperature | +10°C to +35°C with the maximum rate of change not to exceed 10°C per hour |
| Non-Operating Temperature | -40°C to +70°C |
| Non-Operating Humidity | 90%, non-condensing at 35°C |
| Acoustic noise | Sound Power: 7.0 BA in an idle state at typical office ambient temperature. (23 +/- 2 degrees C) |
| Shock, operating | Half sine, 2 g peak, 11 mSec |
| Shock, unpackaged | Trapezoidal, 25 g, velocity change 136 inches/sec (\geq 40 lbs to > 80 lbs) |
| Shock, packaged | Non-palletized free fall in height 24 inches (\geq 40 lbs to > 80 lbs) |
| Vibration, unpackaged | 5 Hz to 500 Hz, 2.20 g RMS random |
| Shock, operating | Half sine, 2 g peak, 11 mSec |
| ESD | +/-15kV except I/O port +/-8KV per Intel Environmental test specification |
| System Cooling Requirement in BTU/Hr | 1660 BTU/hour |

9.2 Product Regulatory Compliance

9.2.1 Product Safety Compliance

The platform complies with the following safety requirements:

- UL60950 – CSA 60950(USA / Canada)
- EN60950 (Europe)
- IEC60950 (International)
- CB Certificate & Report, IEC60950 (report to include all country national deviations)
- GS License (Germany)
- GOST R 50377-92 - License (Russia)
- Belarus License (Belarus)
- Ukraine License (Ukraine)
- CE - Low Voltage Directive 73/23/EEE (Europe)
- IRAM Certification (Argentina)
- GB4943- CNCA Certification (China)
- BSMI certification (Taiwan)

9.2.2 Product EMC Compliance

The platform has been tested and verified to comply with the following electromagnetic compatibility (EMC) regulations when installed a compatible Intel host system. For information on compatible host system(s) refer to the Intel Server Builder Web site or contact your local Intel representative.

- FCC (Class A Verification) – Radiated & Conducted Emissions (USA)
- CISPR 22 – Emissions (International)
- EN55022 - Emissions (Europe)
- EN55024 - Immunity (Europe)
- EN61000-3-2 - Harmonics (Europe)
- EN61000-3-3 - Voltage Flicker (Europe)
- CE – EMC Directive 89/336/EEC (Europe)
- VCCI Emissions (Japan)
- AS/NZS 3548 Emissions (Australia / New Zealand)
- BSMI CNS13438 Emissions (Taiwan)
- GOST R 29216-91 Emissions (Russia)
- GOST R 50628-95 Immunity (Russia)
- Belarus License (Belarus)
- Ukraine License (Ukraine)
- RRL MIC Notice No. 1997-41 (EMC) & 1997-42 (EMI) (Korea)
- GB 9254 - CNCA Certification (China)
- GB 17625 - (Harmonics) CNCA Certification (China)








9.2.3 Certifications / Registrations / Declarations

- UL Certification (US/Canada)
- CB Certification (International)
- CE Declaration of Conformity (CENELEC Europe)
- GS Certification (Germany)
- FCC/ICES-003 Class A Attestation (USA/Canada)
- VCCI Certification (Japan)
- C-Tick Declaration of Conformity (Australia)
- MED Declaration of Conformity (New Zealand)
- BSMI Certification (Taiwan)
- GOST R Certification / License (Russia)
- Belarus Certification / License (Belarus)
- Ukraine Certification (Ukraine)
- RRL Certification (Korea)
- IRAM Certification (Argentina)
- CNCA Certification (China)

Ecology Declaration (International)

9.2.4 Product Regulatory Compliance Markings

The Intel® Server Chassis SR1530 is provided with the following regulatory marks.

| Regulatory Compliance | Region | Marking |
|---|-------------------------|---|
| IRAM Marks | Argentina |  |
| cULus Listing Marks | USA/Canada |  |
| cULus Listing Marks | USA/Canada |  |
| GS Mark | Germany |  |
| CE Mark | Europe |  |
| FCC Marking (Class A) | USA | This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation. Manufactured by Intel Corporation |
| EMC Marking (Class A) | Canada | CANADA ICES-003 CLASS A CANADA NMB-003 CLASSE A |
| C-Tick Mark | Australia / New Zealand |  N232 |
| EMC Marking (Class A) | Canada | CANADA ICES-003 CLASS A CANADA NMB-003 CLASSE A |
| VCCI Marking (Class A) | Japan | この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。VCCI-A |
| BSMI Certification Number & Class A Warning | Taiwan |  R33025 |

| | | |
|-------------------------------------|--------|---|
| | | <p>警告使用者： 這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策</p> |
| GOST R Marking | Russia |  |
| RRL MIC Mark | Korea |  인증번호: CPU-SR1530 (A) |
| China Compulsory Certification Mark | China |  |
| WEEE Mark | |  |
| China RoHS Mark | China |  |
| RRL MIC Mark | Korea |  인증번호: CPU |
| China Compulsory Certification Mark | China |  |
| Recycling Package Mark | China |  |
| Recycling Package Mark | Other |   |

9.3 Electromagnetic Compatibility Notices

9.3.1 USA

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

Intel Corporation
5200 N.E. Elam Young Parkway
Hillsboro, OR 97124
1-800-628-8686

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals that are not shielded and grounded may result in interference to radio and TV reception.

9.3.2 FCC Verification Statement

Product Type: SR1530; S3000AH; S3000AHLX

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

Intel Corporation
5200 N.E. Elam Young Parkway
Hillsboro, OR 97124-6497

Phone: 1 (800)-INTEL4U or 1 (800) 628-8686

9.3.3 ICES-003 (Canada)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadien des Communications.

(English translation of the notice above) This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Canadian Department of Communications.

9.3.4 Europe (CE Declaration of Conformity)

This product has been tested in accordance too, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

9.3.5 Japan EMC Compatibility

Electromagnetic Compatibility Notices (International)

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council For Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

9.3.6 BSMI (Taiwan)

The BSMI Certification number and the following warning is located on the product safety label which is located on the bottom side (pedestal orientation) or side (rack mount configuration).

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

9.3.7 RRL (Korea)

Following is the RRL certification information for Korea.



1. 기기의 명칭(모델명) :
2. 인증번호 :
3. 인증받은 자의 상호 :
4. 제조년월일 :
5. 제조자/제조국가 :

English translation of the notice above:

1. Type of Equipment (Model Name): On License and Product
2. Certification No.: On RRL certificate. Obtain certificate from local Intel representative
3. Name of Certification Recipient: Intel Corporation
4. Date of Manufacturer: Refer to date code on product
5. Manufacturer/Nation: Intel Corporation/Refer to country of origin marked on product

9.3.8 CNCA (CCC-China)

The CCC Certification Marking and EMC warning is located on the outside rear area of the product.

声明

此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取可行的措施。

9.4 Replacing the Back up Battery

The lithium battery on the server board powers the real time clock (RTC) for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.



WARNING

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.



ADVARSEL!

Lithiumbatteri - Eksplosjonsfare ved feilagtig håndtering. Utskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.



ADVARSEL

Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.



WARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.



VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

9.5 Serviceability and Availability

The system is designed to be serviced by qualified technical personnel only.

The desired Mean Time to Repair (MTTR) of the system is 30 minutes including diagnosis of the system problem. To meet this goal, the system enclosure and hardware have been designed to minimize the MTTR.

Following are the maximum times that a trained field service technician should take to perform the listed system maintenance procedures, after diagnosis of the system and identifying the failed component.

| Activity | Time Estimate |
|---|---------------|
| Remove cover | 1 min |
| Remove and replace hard disk drive | 5 min |
| Remove and replace power supply module | 1 min |
| Remove and replace system fan | 7 min |
| Remove and replace control panel module | 2 min |
| Remove and replace baseboard | 15 min |

9.5.1 Product Ecology Requirements

Intel has a system in place to restrict the use of banned substances in accordance with world wide product ecology regulatory requirements. Suppliers Declarations of Conformity to the banned substances must be obtained from all suppliers; and a Material Declaration Data Sheet (MDDS) must be produced to illustrate compliance. Due verification of random materials is required as a screening / audit to verify suppliers declarations.

| Item | Requirement | Description | P | R | Y/N/D | Src |
|------|-----------------|---|---|---|-------|-----|
| | Product Ecology | All materials, parts and subassemblies must not contain restricted materials as defined in Intel's Environmental Product Content Specification of Suppliers and Outsourced Manufacturers – http://supplier.intel.com/ehs/environmental.htm | 1 | 1 | Y | |
| | Product Ecology | Europe - European Directive 2002/95/EC - Restriction of Hazardous Substances (RoHS) Threshold limits and banned substances are noted below. Quantity limit of 0.1% by mass (1000 PPM) for: Lead, Mercury, Hexavalent Chromium, Polybrominated Biphenyls Diphenyl Ethers (PBB/PBDE) Quantity limit of 0.01% by mass (100 PPM) for: Cadmium | 1 | 1 | Y | |
| | Product Ecology | China RoHS | 1 | 1 | Y | |

| | | | | | | |
|--|-----------------|---|---|---|---|--|
| | Product Ecology | WEEE Directive | 1 | 1 | Y | |
| | Product Ecology | All plastic parts that weigh >25gm shall be marked with the ISO11469 requirements for recycling. Example >PC/ABS< | 1 | 1 | Y | |
| | Product Ecology | EU Packaging Directive | 1 | 1 | Y | |

9.6 Restriction of Hazardous Substances (RoHS) Compliance

Intel has a system in place to restrict the use of banned substances in accordance with the European Directive 2002/95/EC. Compliance is based on declaration that materials banned in the RoHS Directive are either (1) below all applicable substance threshold limits or (2) an approved/pending RoHS exemption applies.

Note: *RoHS implementing details are not fully defined and may change.*

Threshold limits and banned substances are noted below.

Quantity limit of 0.1% by mass (1000 PPM) for:

Lead

Mercury

Hexavalent Chromium

Polybrominated Biphenyls Diphenyl Ethers (PBDE)

Quantity limit of 0.01% by mass (100 PPM) for:

Cadmium

9.7 Regulated Specified Components

To maintain the UL listing and compliance to other regulatory certifications and/or declarations, the following regulated components must be used and conditions adhered to. Interchanging or use of other component will void the UL listing and other product certifications and approvals.

Please contact your local Intel representative and reference documents.

- **Server chassis** (base chassis is provided with power supply and fans) —UL listed.
- **Server board**— must use an Intel server board—UL recognized.
- **Add-in boards**—must have a printed wiring board flammability rating of minimum UL94V-1. Add-in boards containing external power connectors and/or lithium batteries must be UL recognized or UL listed. Any add-in board containing modem telecommunication circuitry must be UL listed. In addition, the modem must have the appropriate telecommunications, safety, and EMC approvals for the region in which it is sold.
- **Peripheral storage devices**—must be UL recognized or UL listed accessory and TUV or VDE licensed. Maximum power rating of any one device is 19 watts. Total server configuration is not to exceed the maximum loading conditions of the power supply

9.8 Environmental altitude operation specification

The SR1530AH/SR1530HAHLX has been thermally tested at 900 meters, so the thermal performance is not adequate over 900 meters.

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Appendix A: Integration Tips

This section provides a list of useful information that is unique to the Intel® Server Chassis SR1530 and should be kept in mind while integrating and configuring your Intel® Server Board S3000AH or S3000AHLX.

- Only low-profile (1.2 inch or 30.48 mm) DIMMs can be used in the server chassis.
- Processor fans are not needed and are not supported. The system fan module and power supply fans provide the necessary system cooling. Using a processor fan in this chassis may cause Intel® System Management Software to incorrectly monitor the system fans.
- The air duct must be used to maintain system thermals.
- System fans are not hot-swappable.
- A screw on the front edge of the top cover is required when the unit is installed in a user-accessible environment.
- Make sure the latest system software and BIOS are installed. The latest updates can be downloaded from <http://support.intel.com/support/motherboards/server/S3000AH/>.

Appendix B: POST Code Diagnostic

During the system boot process, the BIOS executes a number of platform configuration processes, each of which is assigned a specific hex POST code number. As each configuration routine is started, the BIOS will display the given POST code to the POST Code Diagnostic LEDs found on the back edge of the server board. To assist in troubleshooting a system hang during the POST process, the diagnostic LEDs can be used to identify the last POST process to be executed.

Each POST code is represented by a combination of colors from the four LEDs. The LEDs are capable of displaying three colors: green, red, and amber. The POST codes are divided into two nibbles, an upper nibble and a lower nibble. Each bit in the upper nibble is represented by a red LED and each bit in the lower nibble is represented by a green LED. If both bits are set in the upper and lower nibbles then both red and green LEDs are lit, resulting in an amber color. If both bits are clear, then the LED is off.

In the below example, the BIOS sends a value of ACh to the diagnostic LED decoder. The LEDs are decoded as follows:

red bits = 1010b = Ah
green bits = 1100b = Ch

Since the red bits correspond to the upper nibble and the green bits correspond to the lower nibble, the two are combined as ACh.

Note: The following example is for illustrative purposes only; the diagram does not match the back edge of the server board in the Intel® Server Systems SR1530AH and SR1530AHLX.

Table 24. POST Progress Code LED Example

| LEDs | 8h | | 4h | | 2h | | 1h | |
|--------|-------|-------|-------|-------|-----|-------|-----|-------|
| | Red | Green | Red | Green | Red | Green | Red | Green |
| ACh | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| Result | Amber | | Green | | Red | | Off | |
| | MSB | | | | LSB | | | |

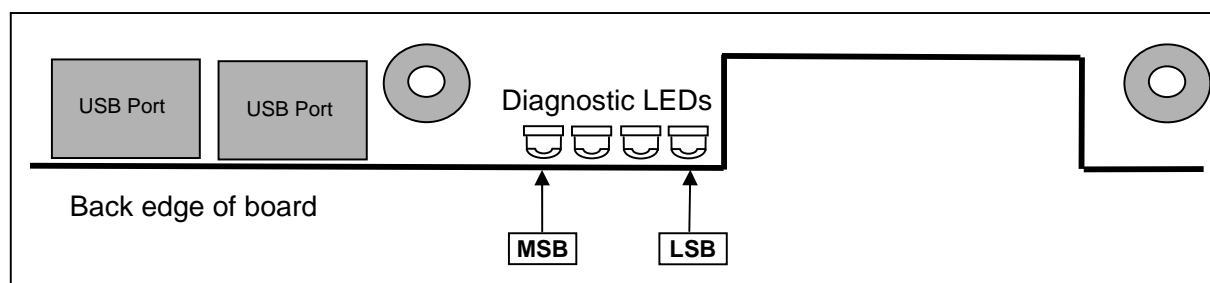


Figure 20. Diagnostic LED Placement Diagram Example

Table 25. Diagnostic LED POST Code Decoder

| Checkpoint | Diagnostic LED Decoder | | | | Description |
|---------------------------|-------------------------|-----|-----|-----|---|
| | G=Green, R=Red, A=Amber | | | | |
| | MSB | | | LSB | |
| Host Processor | | | | | |
| 0x10h | OFF | OFF | OFF | R | Power-on initialization of the host processor (bootstrap processor) |
| 0x11h | OFF | OFF | OFF | A | Host processor cache initialization (including AP) |
| 0x12h | OFF | OFF | G | R | Starting application processor initialization |
| 0x13h | OFF | OFF | G | A | SMM initialization |
| Chipset | | | | | |
| 0x21h | OFF | OFF | R | G | Initializing a chipset component |
| Memory | | | | | |
| 0x22h | OFF | OFF | A | OFF | Reading configuration data from memory (SPD on DIMM) |
| 0x23h | OFF | OFF | A | G | Detecting presence of memory |
| 0x24h | OFF | G | R | OFF | Programming timing parameters in the memory controller |
| 0x25h | OFF | G | R | G | Configuring memory parameters in the memory controller |
| 0x26h | OFF | G | A | OFF | Optimizing memory controller settings |
| 0x27h | OFF | G | A | G | Initializing memory, such as ECC init |
| 0x28h | G | OFF | R | OFF | Testing memory |
| PCI Bus | | | | | |
| 0x50h | OFF | R | OFF | R | Enumerating PCI busses |
| 0x51h | OFF | R | OFF | A | Allocating resources to PCI busses |
| 0x52h | OFF | R | G | R | Hot-Plug PCI controller initialization |
| 0x53h | OFF | R | G | A | Reserved for PCI bus |
| 0x54h | OFF | A | OFF | R | Reserved for PCI bus |
| 0x55h | OFF | A | OFF | A | Reserved for PCI bus |
| 0x56h | OFF | A | G | R | Reserved for PCI bus |
| 0x57h | OFF | A | G | A | Reserved for PCI bus |
| USB | | | | | |
| 0x58h | G | R | OFF | R | Resetting USB bus |
| 0x59h | G | R | OFF | A | Reserved for USB devices |
| ATA / ATAPI / SATA | | | | | |
| 0x5Ah | G | R | G | R | Resetting PATA / SATA bus and all devices |
| 0x5Bh | G | R | G | A | Reserved for ATA |
| SMBUS | | | | | |
| 0x5Ch | G | A | OFF | R | Resetting SMBUS |
| 0x5Dh | G | A | OFF | A | Reserved for SMBUS |
| Local Console | | | | | |
| 0x70h | OFF | R | R | R | Resetting the video controller (VGA) |
| 0x71h | OFF | R | R | A | Disabling the video controller (VGA) |
| 0x72h | OFF | R | A | R | Enabling the video controller (VGA) |
| Remote Console | | | | | |

Appendix B: POST Code DiagnosticIntel® Server Systems SR1530AH, SR1530AHLX and SR1530HAHLX

| Checkpoint | Diagnostic LED Decoder | | | | Description |
|-------------------------------|-------------------------|-----|-----|-----|---|
| | G=Green, R=Red, A=Amber | | | | |
| | MSB | | | LSB | |
| 0x78h | G | R | R | R | Resetting the console controller |
| 0x79h | G | R | R | A | Disabling the console controller |
| 0x7Ah | G | R | A | R | Enabling the console controller |
| Keyboard (PS/2 or USB) | | | | | |
| 0x90h | R | OFF | OFF | R | Resetting the keyboard |
| 0x91h | R | OFF | OFF | A | Disabling the keyboard |
| 0x92h | R | OFF | G | R | Detecting the presence of the keyboard |
| 0x93h | R | OFF | G | A | Enabling the keyboard |
| 0x94h | R | G | OFF | R | Clearing keyboard input buffer |
| 0x95h | R | G | OFF | A | Instructing keyboard controller to run Self Test (PS/2 only) |
| Mouse (PS/2 or USB) | | | | | |
| 0x98h | A | OFF | OFF | R | Resetting the mouse |
| 0x99h | A | OFF | OFF | A | Detecting the mouse |
| 0x9Ah | A | OFF | G | R | Detecting the presence of mouse |
| 0x9Bh | A | OFF | G | A | Enabling the mouse |
| Fixed Media | | | | | |
| 0xB0h | R | OFF | R | R | Resetting fixed media device |
| 0xB1h | R | OFF | R | A | Disabling fixed media device |
| 0xB2h | R | OFF | A | R | Detecting presence of a fixed media device (IDE hard drive detection, etc.) |
| 0xB3h | R | OFF | A | A | Enabling / configuring a fixed media device |
| Removable Media | | | | | |
| 0xB8h | A | OFF | R | R | Resetting removable media device |
| 0xB9h | A | OFF | R | A | Disabling removable media device |
| 0xBAh | A | OFF | A | R | Detecting presence of a removable media device (IDE CDROM detection, etc.) |
| 0xBCh | A | G | R | R | Enabling / configuring a removable media device |
| Boot Device Selection | | | | | |
| 0xD0 | R | R | OFF | R | Trying boot device selection |
| 0xD1 | R | R | OFF | A | Trying boot device selection |
| 0xD2 | R | R | G | R | Trying boot device selection |
| 0xD3 | R | R | G | A | Trying boot device selection |
| 0xD4 | R | A | OFF | R | Trying boot device selection |
| 0xD5 | R | A | OFF | A | Trying boot device selection |
| 0xD6 | R | A | G | R | Trying boot device selection |
| 0xD7 | R | A | G | A | Trying boot device selection |
| 0xD8 | A | R | OFF | R | Trying boot device selection |
| 0xD9 | A | R | OFF | A | Trying boot device selection |
| 0XDA | A | R | G | R | Trying boot device selection |
| 0xDB | A | R | G | A | Trying boot device selection |
| 0xDC | A | A | OFF | R | Trying boot device selection |
| 0xDE | A | A | G | R | Trying boot device selection |
| 0xDF | A | A | G | A | Trying boot device selection |

| Checkpoint | Diagnostic LED Decoder | | | | Description |
|--|-------------------------|-----|---|-----|--|
| | G=Green, R=Red, A=Amber | | | | |
| | MSB | | | LSB | |
| Pre-EFI Initialization (PEI) Core | | | | | |
| 0xE0h | R | R | R | OFF | Started dispatching early initialization modules (PEIM) |
| 0xE2h | R | R | A | OFF | Initial memory found, configured, and installed correctly |
| 0xE1h | R | R | R | G | Reserved for initialization module use (PEIM) |
| 0xE3h | R | R | A | G | Reserved for initialization module use (PEIM) |
| Driver Execution Environment (DXE) Core | | | | | |
| 0xE4h | R | A | R | OFF | Entered EFI driver execution phase (DXE) |
| 0xE5h | R | A | R | G | Started dispatching drivers |
| 0xE6h | R | A | A | OFF | Started connecting drivers |
| DXE Drivers | | | | | |
| 0xE7h | R | A | A | G | Waiting for user input |
| 0xE8h | A | R | R | OFF | Checking password |
| 0xE9h | A | R | R | G | Entering BIOS setup |
| 0xEAh | A | R | A | OFF | Flash Update |
| 0xEEh | A | A | A | OFF | Calling Int 19 (one beep unless silent boot is enabled) |
| 0xEFh | A | A | A | G | Unrecoverable boot failure / S3 resume failure |
| Runtime Phase / EFI Operating System Boot | | | | | |
| 0xF4h | R | A | R | R | Entering Sleep state |
| 0xF5h | R | A | R | A | Exiting Sleep state |
| 0xF8h | A | R | R | R | Operating system has requested EFI to close boot services (ExitBootServices () has been called) |
| 0xF9h | A | R | R | A | Operating system has switched to virtual address mode (SetVirtualAddressMap () has been called) |
| 0xFAh | A | R | A | R | Operating system has requested the system to reset (ResetSystem () has been called) |
| Pre-EFI Initialization Module (PEIM) / Recovery | | | | | |
| 0x30h | OFF | OFF | R | R | Crisis recovery has been initiated because of a user request |
| 0x31h | OFF | OFF | R | A | Crisis recovery has been initiated by software (corrupt flash) |
| 0x34h | OFF | G | R | R | Loading crisis recovery capsule |
| 0x35h | OFF | G | R | A | Handing off control to the crisis recovery capsule |
| 0x3Fh | G | G | A | A | Unable to complete crisis recovery |

Appendix C: POST Error Beep Codes

The following table lists POST error beep codes. Prior to system video initialization, BIOS uses these beep codes to inform users of error conditions. The beep code is followed by a user visible code on POST Progress LEDs.

Table 26. POST Error Beep Codes

| Beeps | Error Message | Description |
|-------|---------------|---|
| 3 | Memory error | System halted because a fatal error related to the memory was detected. |

Glossary

| Word / Acronym | Definition |
|----------------|---|
| ACA | Australian Communication Authority |
| ANSI | American National Standards Institute |
| BMC | Baseboard Management Controller |
| CMOS | Complementary Metal Oxide Silicon |
| D2D | DC-to-DC |
| EMP | Emergency Management Port |
| FP | Front Panel |
| FRB | Fault Resilient Boot |
| FRU | Field Replaceable Unit |
| LCD | Liquid Crystal Display |
| LPC | Low-Pin Count |
| MTBF | Mean Time Between Failure |
| MTTR | Mean Time to Repair |
| OTP | Over-temperature Protection |
| OVP | Over-voltage Protection |
| PFC | Power Factor Correction |
| PSU | Power Supply Unit |
| RI | Ring Indicate |
| SCA | Single Connector Attachment |
| SDR | Sensor Data Record |
| SE | Single-Ended |
| UART | Universal Asynchronous Receiver Transmitter |
| USB | Universal Serial Bus |
| VCCI | Voluntary Control Council for Interference |

Reference Documents

See the following documents for additional information:

- Intel® Server Board S3000AH Technical Product Specification
- Intel® 3000 Series Chipsets Server Board Family Datasheet
- Intel® Server Chassis SR1530 AC Power Supply Module Specification
- Intel® Server Board S3000AH/S3000AHLX Tested Hardware and OS List
- Intel® Server Board S3000AH/S3000AHLX / Intel® Server System SR1530AH/SR1530AHLX Spares/Parts List and Configuration Guide